



Site Visit A: Overview

Site Visit Theme	Agriculture and Food Security: Adapting to Climate Change
Location	Subang and Purwakarta vicinity, West Java
Main site visit	International Centre for Rice Research (ICRR), Sukamandi, Subang
Additional site visits	Jatiluhur Dam, Purwakarta



<p>Main Issues</p>	<p>The impact of climate change on agriculture.</p> <p>Increases in flooding, drought and average temperatures, contributing to the rise of pests and disease are all effects of climate change, and have begun to adversely impact rice production in one of the world's most populous countries. As a major producer and consumer of rice, Indonesia's food security status and livelihood of its rural populations are expected to be dramatically threatened by climate change.</p> <p>What adaptation responses are required to ensure food security and prevention of loss of livelihoods for Indonesia's population? How are increasingly variable resources such as water to be managed? What are the implications for stakeholders dependent on this resource?</p>
<p>Cross Cutting Issues</p>	<ul style="list-style-type: none"> • Participatory decision making • Use of traditional knowledge • Social justice and equity • Gender and development
<p>Background</p>	<p>Increasing rice production to meet the population demand is one of the major issues in Indonesia's development program. Such programs, which also focus efforts to improve farmers' incomes, are challenged by various factors, including extreme climate/climate change. With a population of 220 million mainly dependent on rice for their staple diet, climate change will adversely impact rice production. For every 1 degree increase in temperature, a 10% decline in rice yields is predicted. Climate change will lead to variability in precipitation (heavy rain and drought) which will delay planting time, increase CO2 emissions from rice paddies during droughts, and lead to an increase in pests and disease. The case study demonstrates this is already happening.</p> <p>Subang is the third largest rice growing region in the country. Water scarcity is already a problem, and will be worsened with climate change. Some areas will become too warm for sufficient rice production. Water scarcity is exacerbated with run-off caused by deforestation and land clearing. The resulting siltation in rivers and dams further leads to reduced irrigation available for crops.</p>

Challenges and Potential Solutions

Adapting Indonesia's main agricultural crop – rice – to the variabilities of climate change, which include increased flooding, drought and increased pest and disease prevalence, while maintaining an increase in sustainable rice production to ensure food security for Indonesia's growing population, is the main challenge raised within this case study.

Opportunities exist to revive and apply traditional farming methods for water conservation, drought management and low input rice production. However can these methods be applied on a larger scale? Research in new varieties of rice combined with efficient information dissemination systems also offer potential solutions to farmers experiencing the impacts of climate change.

About the Site Visit

The lower stream of Citarum river basin is 6,540 square kilometers (22% of the area of West Java province) flowing from its source at Wayang Mountain in District of Bandung to the Java Sea in District of Kerawang. There are three big dams in the river basin; Saguling Dam, Cirata Dam, and Jatiluhur Dam. These three dams bear vital roles, i.e. to provide water supply for households in Jakarta and several surrounding districts for irrigation and industrial purposes. The water management from Jatiluhur (also called Juanda Dam) is operated by Perum Jasa Tirta II (government owned enterprise).

The condition of Citarum river basin has been deteriorating resulting from pollution from factories and deforestation in the water catchment area. During the dry season, the rate of water flow drastically drops. In 1983, the forest area in the river basin was 85,138 hectares (36% of Citarum river basin) however in 2002, the forest area had shrunk more than half to 39,150 hectares.

Key Stakeholders

- International Rice Research Centre (IRRC)
- Perum Jasa Tirta II, Authority of Jatiluhur Dam

Innovative Aspects of the Site Visit

The Indonesian Centre for Rice Research (ICRR) has engineered some rice varieties which are drought tolerant, have a shorter planting time, as well as produce less methane emissions. Such varieties are best suited for longer drought periods.

Farmers and local government have sought to revive traditional water conservation methods and water allocation systems to deal with problems of water scarcity and social equity in the community.

System of Rice Intensification (SRI) or organic agriculture (OA) has been initiated by some farmers.

Impacts of the Project Towards Sustainable Development

When we take a closer look at agriculture in this region, there is very little to suggest that it is sustainable. Hybrid varieties of rice require high inputs of fertilisers and pesticides, leading over time to a decline in soil fertility and an increase in the occurrence of pests and crop diseases, which in turn leads to higher pesticide and fertiliser use. Intensive mono-cropping (the planting of few species) combined with two to three successive crops planted per year further exposes the ecosystem to hardier pests and crop diseases and the degradation of the soil. The effects of excessive fertiliser and pesticide use are well documented (others effects include water contamination and indebtedness of farmers) and are becoming evident to some degree in the Bandung region.

Some small scale low cost initiatives are being used by farmers – such as mechanisms for water conservation. Organic agriculture also is being adopted in some regions and is demonstrating good results. However, there is much debate about organic agriculture’s potential to produce sufficient quantities to feed the country’s population.

Research and development in new rice varieties is continuing. There has been research into genetically modified varieties of rice resistant to drought and saline conditions; however such varieties are not evident in the Bandung region yet. With respect to sustainable agriculture, many would strongly contest genetically modified varieties of rice being offered as a long term safe and sustainable solution to the challenge of food insecurity exacerbated by climate change